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PROCEEDINGS.

Seven hundred and eighty-third Meeting.

May 26, 1885. — ANNUAL MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary presented the Report of the Council.

The following gentlemen were elected members of the Academy : —

John Codman Ropes, of Boston, to be a Resident Fellow in Class III., Section 3.

Ezekiel Gilman Robinson, of Providence, to be an Associate Fellow in Class III., Section 1.

The annual election resulted in the choice of the following officers : —

JOSEPH LOVERING, *President.*

OLIVER W. HOLMES, *Vice-President.*

JOSIAH P. COOKE, *Corresponding Secretary.*

WILLIAM WATSON, *Recording Secretary.*

HENRY P. KIDDER, *Treasurer.*

NATHANIEL D. C. HODGES, *Librarian.*

Council.

AMOS E. DOLBEAR,
ROBERT H. RICHARDS, } of Class I.
WOLCOTT GIBBS,

ALEXANDER AGASSIZ,
 BENJAMIN E. COTTING, } of Class II.
 SERENO WATSON,

JAMES B. AMES,
 JUSTIN WINSOR, } of Class III.
 ANDREW P. PEABODY,

Rumford Committee.

WOLCOTT GIBBS, JOSIAH P. COOKE,
 EDWARD C. PICKERING, JOSEPH LOVERING,
 JOHN TROWBRIDGE, GEORGE B. CLARK,
 ERASMUS D. LEAVITT, JR.

Member of the Committee of Finance.

THOMAS T. BOUVÉ.

The President appointed the following standing committees:—

Committee of Publication.

JOSIAH P. COOKE, ALEXANDER AGASSIZ,
 WILLIAM R. NICHOLS.

Committee on the Library.

HENRY P. BOWDITCH, HENRY W. HAYNES,
 BENJAMIN A. GOULD.

Auditing Committee.

HENRY G. DENNY, AUGUSTUS LOWELL.

The following appropriations were voted:—

For general expenses	\$2,200
For publications	2,000
For the library	1,000

Professor Pickering called attention to the urgent need of a complete index to all the publications of the Academy, and, on his motion, it was

Voted, To refer this matter to the Committee of Publication.

On the motion of the Corresponding Secretary, it was

Voted, To meet, on adjournment, on the second Wednesday in June.

The following papers were presented by title:—

Contributions from the Physical Laboratory of Harvard University.—I. On a New Method of determining the Mechanical Equivalent of Heat. By A. G. Webster.

Researches conducted with the Aid of the Rumford Fund. I. Early Experiments in transmitting Musical Sounds. II. Observations of Atmospheric Refraction. III. Accidental Errors and the Rejection of Doubtful Observations. IV. Stellar Photography. V. Specular and Diffuse Refraction and Reflection. By Edward C. Pickering.

Seven hundred and eighty-fourth Meeting.

JUNE 10, 1885.—ADJOURNED ANNUAL MEETING.

The PRESIDENT in the chair.

The President announced the death of the oldest Resident Fellow, Robert Treat Paine, of Brookline.

The Corresponding Secretary read a letter from Mr. John C. Ropes, acknowledging his election as a Resident Fellow.

The report of the Treasurer was received and audited.

The report of the Librarian was read and accepted.

The following report of the Rumford Committee was read and accepted:—

The Rumford Committee present the following report for the year ending with this Annual Meeting.

The researches connected with light or heat which have been instituted or continued from last year, and conducted by sub-committees of the general Committee, are,—

1st. On some Applications of Spectrometry and Photometry to Astronomy. By Prof. E. C. Pickering.

2d. On a Standard of Light. By Prof. Trowbridge.

3d. On the Effect of Extreme Temperatures on the Strength of Magnets. By Prof. Trowbridge.

4th. On the Electrical Control of Equal Temperature, &c. By Prof. W. A. Rogers.

5th. On Dry-Plate Photography. By Mr. W. H. Pickering.

The results which have been reached in these researches have been communicated to the Academy during the year, and will appear in fuller detail in the forthcoming volume of Proceedings.

The Academy appropriated for the use of the Rumford Committee \$1,000. Of this sum only \$431.16 has been paid out by the Treasurer.

In this, as in former years, the income of the Rumford Fund has also been useful in relieving the general fund. It contributed \$428.18 towards the payment of the printing of Vol. XIX. of Proceedings, and \$142.64 for the purchase of books or journals relating to light or heat.

In conclusion, the Rumford Committee recommend an appropriation of \$1,000, to be expended for researches on light or heat, with the understanding that the unexpended balance of last year, viz. \$568.84, remains in the hands of the Treasurer.

All which is respectfully submitted,

JOSEPH LOVERING, *Chairman.*

Boston, June 10, 1885.

In accordance with the recommendation of the Rumford Committee, it was

Voted, To appropriate the sum of one thousand dollars (\$1,000) from the income of the Rumford Fund to be expended for researches on light or heat.

The following paper was presented:—

On the Influence of Magnetic Stress upon the Capacity of an Electric Condenser. By Alonzo S. Kimball.

The following papers were presented by title:—

Photography of the Corona without an Eclipse. By William H. Pickering.

Contributions to the Botany of North America. By Asa Gray.

Comparison of Alcohol Thermometers Baudin 8208 and 8209 with the Air Thermometer at Low Temperatures. By Anthony C. White.

Determination of the Orbit of Comet 1883. I. (Brooks) from three Normal Places comprising 41 Observations. By Oliver C. Wendell.

Seven hundred and eighty-fifth Meeting.

October 14, 1885.—STATED MEETING.

The PRESIDENT in the chair.

The President announced the death of Henri Milne Edwards, Foreign Honorary Member.

The Corresponding Secretary read the following letters: from H. Wild, acknowledging his election as Foreign Honorary Member; from the Royal Society of Northern Antiquaries, announcing the death of its Vice-President, M. Worsaae; from Lieutenant Charles R. Miles, Secretary of the United States Naval Institute at Annapolis, inviting the members of the Academy to be present at the reading of Lieutenant Danenhower's paper on the polar question.

The following gentlemen were elected members of the Academy:—

Edward Singleton Holden, of Madison, Wisconsin, to be an Associate Fellow in Class I., Section 2.

George Washington Cullum, of New York, to be an Associate Fellow in Class I., Section 4.

George Shattuck Morison, of New York, to be an Associate Fellow in Class I., Section 4.

The following papers were presented:—

On the Apparent Position of the Zodiacal Light. By Arthur Searle.

The Measurement of the Strength of Telephone Currents. By Charles R. Cross and James Page.

The Thermal Telephone. By Charles R. Cross.

On the Square-Bar Micrometer. By Seth C. Chandler, Jr. (By title.)

Professor Dolbear spoke of the philosophical structure of the magnet, and exhibited a magnet made of brass upon which iron had been deposited by the action of a galvanic current.

Professor Searle read a paper by William A. Rogers, entitled, "Observations on the Flood Rock Explosion."

Seven hundred and eighty-sixth Meeting.

November 11, 1885. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from Messrs. Cullum and Morison, acknowledging their election into the Academy.

The President announced the death of Dr. William B. Carpenter, recently nominated for Foreign Honorary Membership.

Professor Marquand exhibited and explained the operation of a new logic machine invented by himself.

Seven hundred and eighty-seventh Meeting.

December 9, 1885. — MONTHLY MEETING.

The PRESIDENT in the chair.

The following papers were presented: —

Experiments upon the Determination of the Temperature of Metals as a Function of their Mass. By William A. Rogers and Austin L. McRae.

On Atmospheric Refraction. By Edward C. Pickering.

Mr. Whiting showed experimentally a new method of determining the rate of vibration of a tuning-fork.

Mr. Chandler called the attention of the Academy to an error in the formula relative to the ring micrometer. This error had been repeated in several editions of Bruno's Spherical Astronomy.

Seven hundred and eighty-eighth Meeting.

January 13, 1886. — STATED MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary made a short report on the preparation of a complete index to the publications of the Academy. This report was, after a brief discussion, referred back and the committee continued.

The Corresponding Secretary was requested to communicate to the family of the late Dr. Carpenter the fact of his nomination, and to express their grief on his death, which prevented his election at this meeting as Foreign Honorary Member of the Academy.

The following gentlemen were elected members of the Academy: —

Gaetano Lanza, of Boston, to be a Resident Fellow in Class I., Section 4.

William Thompson Sedgwick, of Boston, to be a Resident Fellow in Class II., Section 3.

Pierre Joseph van Beneden, of Louvain, to be a Foreign Honorary Member in Class II., Section 3, in place of the late Carl Theodor Ernst von Siebold.

Felix Joseph Henri de Lacaze-Duthiers, of Paris, to be a Foreign Honorary Member in Class II., Section 3, in place of the late Henri Milne Edwards.

The following papers were presented: —

Biographical notice of the late Dr. Samuel Cabot. By Oliver W. Holmes.

On the Capitalization of Land in Early Society. By Denman W. Ross.

On the Coincidence of Certain Lines in the Stellar, Solar, and Electric Arc Spectra. By William H. Pickering.

Mr. Whiting presented a note on a method of determining simple rigidity by vibration under torsion.

Seven hundred and eighty-ninth Meeting.

February 10, 1886.—MONTHLY MEETING.

The PRESIDENT in the chair.

Communications were read by the Corresponding Secretary from H. M. Hugunin, of Chicago, relative to changing the date of the beginning of the civil year; from the Royal Society of New South Wales, enclosing a list of original researches for which the society offered prizes; from the President of the Society of Physics and Natural History at Geneva, announcing the subject of the De Candolle prize; from the French-Canadian Institute at Ottawa, giving a history of the foundation of the institution, and soliciting funds for its maintenance; from Commodore George E. Belknap, Superintendent of the United States Naval Observatory, communicating a programme of the work to be pursued at the Observatory during the current year.

The President announced the death of Henry P. Kidder, Treasurer of the Academy.

The following papers were presented:—

Thunder-storms in New England in 1885. By William M. Davis.

Observations of Variable Stars in 1885. By Edward C. Pickering.

Professor Pickering exhibited photographs illustrating the application of photography to transit observations. He also described a method by which the entire aperture of any telescope might be used for photographing stellar spectra without employing a slit.

Professor Hooper read a paper by Professor Dolbear on the conditions that determine the length of the spectrum.

The Corresponding Secretary presented, by title, the following papers:—

On Benzoltrisulphonic Acid. By C. Loring Jackson and John F. Wing.

On the Action of Sodium on Tribenzylamine. By C. Loring Jackson and John F. Wing.

Seven hundred and ninetieth Meeting.

March 10, 1886. — STATED MEETING.

The PRESIDENT in the chair.

The President announced the death of Professor William Smith Clark, of Amherst, Resident Fellow.

The Corresponding Secretary read letters from Mrs. Carpenter, thanking the Academy for the intended honor to her late husband; from the Society of Natural History at Cassel, inviting the Academy to send a delegate to their semi-centennial jubilee; and from J. van Beneden, acknowledging his election as Foreign Honorary Member.

The President announced vacancies occasioned by the death of Mr. Henry P. Kidder, Treasurer, and the resignation of Mr. N. D. C. Hodges, Librarian. These vacancies were filled by the election of the following officers:—

AUGUSTUS LOWELL, *Treasurer*.

HENRY W. HAYNES, *Librarian*.

On the motion of Professor Cooke, it was

Voted, That the following proposed alteration of the statutes be referred to a committee: that the Librarian be *ex officio* a member of the Council.

The President appointed Messrs. Scudder, Gray, and Cooke members of this Committee.

Emil Heinrich Du Bois-Reymond, of Berlin, was elected a Foreign Honorary Member in Class II., Section 3, in place of the late Gabriel Gustav Valentin.

The following paper was presented:—

Equal Temperament and its Realization on Keyed Instruments. By Charles R. Cross.

Seven hundred and ninety-first Meeting.

April 14, 1886. — MONTHLY MEETING.

The PRESIDENT in the chair.

Mr. Haynes was appointed Recording Secretary *pro tempore*.

Professor Safford presented a paper on Star-places observed at Williams College Observatory in 1884, with remarks on the present fundamental catalogues.

Mr. Edmands spoke of a device to do away with the collimator lens.

Mr. Sereno Watson presented the following papers:—

Preliminary Synopsis of North American Carices. By L. H. Bailey, Jr.

Contributions to American Botany:—1. Revision of the North American Ranunculi. 2. *Sertum Chihuahuense*, an account of collections of plants made in Chihuahua, by C. G. Pringle and Edward Palmer. 3. *Miscellanea*. By Asa Gray.

Contributions to American Botany:—1. A List of Plants from Southwestern Chihuahua, Mexico, collected by Dr. E. Palmer, 1885. 2. Descriptions of New Species of Plants, chiefly from the Pacific States and Chihuahua. 3. Notes upon some *Polypetalæ* and Palms of Eastern Guatemala. By Sereno Watson.

Seven hundred and ninety-second Meeting.

May 12, 1886. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read a letter from Emil Du Bois-Reymond, acknowledging his election as Foreign Honorary Member.

The following papers were presented:—

A biographical notice of the late Edward Tuckerman. By Asa Gray.

The Crystalline Structure of Iron Meteorites. By Oliver W. Huntington. (By invitation.)

A Catalogue of Polar Stars for the Epoch 1875.0 resulting from all the available Observations made between 1860 and 1883, and reduced to the System of the Catalogue of Publication XIV. of the *Astronomische Gesellschaft*. By William A. Rogers and Anna Winlock.

Professor Gray presented the following paper by title:—

Notes on Arctic Algæ. By William G. Farlow.

Professor Cooke presented, by title, the following papers:—

On a Relation between the Formation of Anilides and the Constitution of Unsaturated Fatty Acids. By Arthur Michael.

Same title (second communication). By A. Michael and G. M. Palmer.

On the Action of Anilines on Brommaleic and Bromfumaric Acids. By A. Michael.

On Isomerism in the Cinnamic Acid Series. By A. Michael and G. M. Browne.

On Alloisomerism. By A. Michael.

Citraconic Acid as a Reagent for the Detection and Separation of Aromatic Amines. By A. Michael.

The Conversion of α -Bromcinnamic Ether into Benzoyl-acetic Ether. By A. Michael and G. M. Browne.

On the Action of Phosphorous Pentachloride on Organic Ethers. By A. Michael.

On the Action of Phosphorous Pentachloride on Phenoxy-acids. By A. Michael.

On the Action of Aldehydes on Phenols. By A. Michael and J. P. Ryder.

On the Action of Picrylchloride on Sodium Acetacetate. By A. Michael and J. P. Ryder.

On Mono- and Dipicrylhydroxylamine. By A. Michael and G. M. Browne.

A Method for preparing Bromderivatives of Fatty Acids. By A. Michael.

On the Ethylmethylenedisulphonate. By F. O. Kendall.